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## THE APPLICATION OF RESEARCH FINDINGS IN FARM ADVISORY WORK

**J. C. GERRING\***

PREVIOUS PRESIDENTS of this Society have, for the most part, chosen subjects on which they have made a particular study. Many have taken the opportunity which a presidential address allows, of speculating, somewhat philosophically, on what they consider might be the future developments in their own field.

I cannot claim to be a specialist, and hence am unable to follow this pattern. However, for some years I have been concerned with the interpretation of research findings and their application to farming practice, and I propose discussing some aspects of this subject—Research and its Application. In electing me to be your President, you have paid tribute to the efforts of all advisory workers in fulfilling one of the objectives of this Society, namely, to foster improvement in animal production. In this address I should like to do something towards fulfilling another equally important objective of this Society, which is to bring about active collaboration of all workers in the field of animal production.

For an efficient advisory service three requirements have received considerable emphasis from a number of previous speakers to this Society:

- (1) A close liaison must be maintained between research and extension.
- (2) Advisory officers need a first-class training in extension methods.
- (3) A complete farm advisory service must be provided.

Dealing first with the need for a close tie-up between research and the advisory services: As I see it, agricultural research has the same ultimate objective as farm advisory service—to make farming more productive and more profitable. Both research and advisory workers have exactly the same end in view; this

\*Ruakura Animal Research Station, Hamilton.

will be achieved much more readily if both work together as a complementary team.

To bring this about a major change in the organization and administration of our advisory service has sometimes been advocated. I believe, at least in the first place, that a change in *attitude* would be much more effective. What do I mean by this? Research workers could be more appreciative than they are of some of the difficulties confronting the man in the field. It is easy to quote production results obtained at experimental stations, as targets or potential levels which farmers generally could reach by the judicious application of research findings. It is obviously important to have such targets, they act as incentives and stimulate interest and effort towards their achievement. But the fact that many farmers lag behind, for anything up to twenty years we are told, is all too often used to at least imply that there is something wrong with the advisory services. At an experimental station, inertia, managerial ability, the capacity for work, finance, labour and machinery, are seldom limiting factors to high production. On a commercial farm such factors exercise a major influence in determining first, whether improvements are adopted or not, and, second, the skill, vigour and enterprise used to put them in practice.

Advisory workers, on the other hand, all too often regard research people as rather remote types, somewhat unapproachable, and much too engrossed in their own work to bother discussing problems with a field man. This attitude is, I believe, most unfortunate; it curbs any free and frank discussing of mutual problems on an equal footing, and prevents misunderstandings which must inevitably occur being ironed out. Looking back as a field adviser, I held somewhat similar views before going to Ruakura. For this reason I remember taking up my job at the Station with some misgivings. I soon found that these ideas about research people were figments of my own imagination. I have found research workers not only at Ruakura, but at Massey College, Grasslands Division and elsewhere, always willing to discuss their work and explain any particular aspect of it. In fact I would say that the higher his standing the more approachable he is. I cannot recall any advisory officer being refused access to any available research worker at Ruakura, at any time over the period I have been there. In fact, I am quite certain that such contacts are welcomed. Those engaged in research work on farming problems must have contact with both field men and farmers, who often act as "sounding boards" for a critical appraisal of their ideas. Advisory men who have gone out of

their way to rub shoulders with their colleagues engaged in research, in a sincere attempt to contribute to any discussion on an equal basis, have found it to be an enriching experience.

I have heard it suggested by people in very high places that research findings should be allowed to mature for a few years before being applied. This suggests that they are publicized before being adequately tested. It may be a valid criticism in a few instances, though it is not one which should unduly worry anyone, except the research workers themselves.

In any case, research workers cannot be blamed for this situation; farmers in this country insist on knowing what research men are doing, and it is a healthy sign that they do. To meet this demand, research institutions have adopted the practice of holding an annual conference at which farmers are kept in touch with current research. Because of the long-term nature of research, it is sometimes necessary, in order to draw up an attractive conference programme, to deal with tentative results from projects still in progress. Research workers themselves are very conscious of this pressure, and are usually reluctant to discuss results unless these are reasonably well documented.

Personally I have no worries on this score. One of the most important contributions to farming efficiency is the stimulation of intelligent interest in problems of animal production. This stimulation often results from research leaders expressing their views on current farming problems at such conferences without having to provide the experimental evidence in chapter and verse. I believe that research men who have the confidence of the farming community are sufficiently cautious, in a scientific sense, to avoid making statements which are too wide of the mark, and farmers are either sufficiently intelligent to sort it out for themselves, or conservative enough to delay trying out new ideas before these have been tested. It should be remembered, too, that research workers get no reward for speaking at farmers' meetings; they do it because they feel it is part of the overall job of raising production.

It is sometimes said that research findings have little or no application in districts where climatic or other conditions are very different from that of the experimental station. This view fails to appreciate that the major function of research is to establish principles; principles which are capable of widespread application. To take an example, research has shown that under grassland conditions cows which are in good condition at calving

will produce more milk and butterfat than if they calved in thin condition. This principle applies wherever cows are kept on grass. In the experiment concerned, large amounts of autumn-saved pasture were used to get the well-fed cows in good condition. In some parts of New Zealand it may be possible to provide autumn-saved pasture. Only the advisory officer can decide the best means of getting cows in good condition before calving. In some districts a crop may be necessary, in others silage and hay, under some conditions it may even pay to feed concentrates. Whatever method is used the principle is still being applied. Again, ewes well fed before mating, produce more twins than if they were poorly fed, whether they are fed on grass or grain.

Sometimes confusion arises owing to an erroneous use of the principle established, or to making unwarranted deductions from it. To give an example, grassland research workers in different parts of the world have shown that pastures mown once a month produce more than twice as much dry matter per acre per annum as those mown once a week. This finding has been used more widely than most in advisory work to illustrate the advantages of rotational grazing! It seems to be a reasonable deduction until animal workers show that lambs do better and produce more meat if set-stocked continuously from birth to drafting, than if they are rotationally grazed. These two findings are and will remain quite irreconcilable to those who erroneously think of animals as mowers.

Experiments designed to evaluate management techniques present a more difficult problem. Here conclusions reached at main research centres need testing on a wide scale on a complete farm basis, before they can be accepted with confidence.

Now, the most simple, the most obvious, and I believe the most effective way of removing these and other differences and misunderstandings, and at the same time obtaining close co-operation between research and advisory men, would be to place where possible, senior advisory officers at centres of research and agricultural teaching. I put forward this suggestion as a logical future development which would go a long way to weld the three services together into an effective team. I have often wondered what particular advantage is gained by giving a farm adviser an office in town. With his headquarters at a research centre he could contribute his ideas on the type of research to be carried out. At an agricultural college he would inevitably influence the kind of training given to future recruits to the service. Today field advisory officers have virtually no say in either research or in teaching.

Principles established by research are usually stated in quite simple terms. Yet in their application they can be influenced by so many factors that it is vital to understand them fully. To say that the production of animal products from grassland depend on three factors—the amount of grass grown, the proportion eaten by the animals, and the efficiency with which the grass eaten is converted into animal products—sounds obvious. Yet an understanding of these principles, and an appreciation of the way in which each one can be influenced by a wide variety of managerial practices, could form the basis of a farm adviser's approach to his work. They could help him to pin-point systematically the limiting factors to increased production on each farm. Only the closest possible association between the men establishing principles and those whose job it is to apply and integrate them into farming practice will bring about this understanding.

I referred at the outset to two other requirements of an efficient advisory service: a first-class training in extension methods and the need to provide a complete farm advisory service. In these respects three important and significant changes have taken place during the past year. First, Massey Agricultural College has sent a promising young graduate overseas for a thorough training in extension methods. Secondly, the College has also announced its intention of developing "farm extension" as a major subject of the degree course. Thirdly, the Department of Agriculture has recognized the need for a complete farm advisory service. This represents a major change in policy, which is obviously an essential first step.

For these changes to be effective, however, it will be necessary to appreciate quite clearly some of the differences between a specialist advisory service and the more comprehensive approach.

It is relatively easy and straightforward to train men as specialists. Those trained in this way can speak with confidence and authority to farmers on matters pertaining to their particular field. In general, too, farmers are ready to accept the advice of such men. They are usually prepared to acknowledge the specialist's authority in his own subject. Despite this undoubted advantage, specialist advice usually affects only one small aspect of a farm. To spray a crop infested with weeds, to include potash in the fertilizer, or to vaccinate a flock of ewes, requires only a minor modification of the farming operations. While such advice may be sound, such a piecemeal approach too often misses the key limiting factors to efficient production.

In contrast, it is much more difficult to train men as general farm advisory officers, capable of integrating the many different facets of farming. Most farmers feel competent to discuss questions of farm management on a completely equal footing with advisory officers. They are not so ready to acknowledge authority in a field in which they themselves have had a great deal of practical experience. In many cases, too, advice on farm management means making a major change in farming policy, perhaps involving radical alterations in farm layout, in the class of stock carried, or in the allocation of finance.

To give sound advice on such matters is by no means the easy, straightforward task that many people seem to think. No textbooks or bulletins will provide the answer to such problems. Each case has to be considered separately for each farm. The adviser must assess the capability of the farmer, the labour likely to be available to carry out the advice, and the finance available to meet it. He must ask himself such questions as: Will it give the farmer the best return for the effort and money used? To what extent will other, equally essential, farming activities be affected if the advice is adopted? Are the risks involved reasonable? Can they be minimized still further?

Men who are already specialists in soils and plants cannot be changed into farm advisers, capable of giving this kind of advice, simply by superimposing yet another specialist training in animals. They also need experience and guidance in integrating the various factors involved. Nor is it reasonable, fair, or indeed sound, to expect recent graduates to take on such work without further post-graduate training in this field.

In my view, actual experience in planning the overall management policy of a particular farm, and personal responsibility for making the day-to-day decisions in carrying it out, are the most effective means of training competent farm advisory officers.

To provide this type of training I believe the Department of Agriculture should seriously consider purchasing a number of farms in different districts—farms which would be representative of the major systems of farming in New Zealand. If only ten such farms were acquired, each recruit to the advisory service would have an opportunity of getting invaluable experience in the actual management of a farm, before being called upon to give advice to farmers.

Today, the recent graduate is trained in a number of highly technical subjects, but he has at best only a limited experience in using or applying that knowledge for the purpose of running

a farm. Yet it is this application of his knowledge which he will be called upon to do for most of his advisory career. Farmers are not particularly concerned with all that lies behind the discovery of some new technique. What they want to know is how can it be used on their farm to the best advantage.

Now, if anyone really thinks about the problem, surely he must agree that this sort of experience cannot possibly be obtained simply by working on a farm. The most competent tractor driver, fencer, or milker, could fail completely as a farm manager. It is only by taking full responsibility for running the farm as a whole that one can learn to use technical knowledge, as it applies to farming, in an integrated way.

In the operation of this suggestion, recruits to the advisory service would spend a short period of two to three months, full time, on a Departmental farm; long enough to become thoroughly familiar with the set-up, potentialities and managerial needs of the farm concerned, and to plan the overall farm management policy. This would be done under the supervision of a senior field man. From then on they would need to spend no more than an hour or so each day to direct and supervise its day-to-day management. The remainder of their time would be spent doing advisory work. In my view, there is no more effective way of becoming familiar with the problems facing farmers every day, or of getting to know how farmers think and plan and act, than by running a farm oneself.

As many of you know, the station at Ruakura is divided into 12 to 15 units or farms, each being under the control of a research officer. Over the years this arrangement has proved to be sound, for it ensures that each research man has complete control of his experimental animals. At the same time, without exception, the research workers themselves agree that the practice has brought each one of them in much closer contact with farming problems and has materially helped them to relate their work to farming practice.

Putting qualified men in charge of a farm has had other important results. A few years ago Wallace came out with a suggestion which, I am sure, many advisory officers will agree represented a radical change in farming methods. I refer to his advice to dairy farmers that they should feed out the major portion of their winter reserves during the autumn and early winter months when grass growth is normally sufficient to provide for the needs of the animals. After a good deal of questioning by farmers and a lot of amplification, Wallace's ideas have been widely accepted by farmers in the major dairying areas.

Now the point that interests me and the one relevant to this discussion, is that this idea did not originate from a particular piece of research. It came as a direct result of his responsibility for running a farm and having to feed a dairy herd.

The round farrowing house, evolved by Smith, the provision of long mature feed for preventing ill-thrift in hoggets originated by Clarke, the use of the electric fence first thought of by Riddet, are other examples of important and worthwhile ideas which have stemmed very largely from the personal responsibility of running a farm.

Departmental farms could become the headquarters of the district advisory service; they could be used to demonstrate the local application of improved farming techniques, as is at present done by the National Agricultural Advisory Service in England and Wales. As mentioned earlier, many research findings on what are essentially managerial problems need testing out on a complete farm basis, in widely different districts. If this were done on Departmental farms, advisory men would get a fuller understanding of the application of such findings, and have more confidence in recommending their use to farmers.

It is becoming increasingly evident that there are many subtle, and as yet undetermined, factors in farm management which exert important influences on the level of production obtained on individual properties. Departmental farms could be used to help elucidate these factors which represent a challenge to both research and advisory men.

In this address I may well have over-emphasized some of the imperfections in our present set-up. Despite these no-one can fail to be impressed with the extraordinary increases which have taken place in our sheep industry over the past few years. After remaining almost stationary, at approximately 32 million, for a period of 12 years, 1938-1949, sheep numbers have reached record levels in each successive year since 1951. In the last year for which figures are available, 1957-58, they rose by no less than three million to a total of 46 million. This is the highest percentage increase, 8.6, ever recorded. In the *Annual Review of the Sheep Industry, 1958-59*, published by the New Zealand Meat and Wool Boards' Economic Service, it is considered that an estimate of 49 million sheep for 1959 would not be unreasonable.

Both research and advisory services have played an essential part in these spectacular developments. By even closer collaboration, still further achievements will be made.